Please note: the substantive content of the 2026 NRI Roadmap Survey begins at Question 20 (with prior questions dealing with administrative and other information).

As such all submissions that are published include the responses submitted from Question 20 onwards only.

Q20.

Part 2: Research themes

2.1 NRI comprises the assets, facilities and associated expertise to support leading-edge research and innovation in Australia and is accessible to publicly and privately funded users across Australia and internationally. We are seeking your input on possible directions for future national-level investment - i.e., where the requirements are of such scale and importance that national-level collaboration and coordination are essential.

The 2021 Roadmap used a challenge framework to support NRI planning and investment. With this in mind, consider likely future research trends in the next 5 - 10 years, and with respect to one or more of the 8 challenge areas identified in the 2021 Roadmap as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or not at sufficient scale and
- describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities.

Q21.

Resources Technology and Critical Minerals Processing

Q22.

Food and Beverage

Q23.
Medical Products

Q24.
Defence

Q25.
Recycling and Clean Energy

Q26.
Space

Q27.
Environment and Climate

Q28.
Frontier Technologies and Modern Manufacturing

Q29.

2.2 The 2024 statement of National Science and Research Priorities (NSRPs) includes outcomes linked to each priority to assist in identifying critical research needed in the next 5 to 10 years.
Consider the priority statements and, with respect to one or more of the 5 priority areas as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or
- not at sufficient scale and describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities, and where relevant, refer to the underpinning outcomes and research identified in the NSRPs document.

Q30.

Transitioning to a net zero future

Q31.

Supporting healthy and thriving communities

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia’s environment

Q34.

Building a secure and resilient nation

Q35.
2.3 The case for a new NRI capability, or enhancements to existing capabilities, typically emerges through advocacy from research communities clustering around rigorously identified needs and goals. Such a concept could respond to a requirement for novel or expanded capacity within a domain, or across domains, and must be such that it could only be made available with national-level investment.
If you have identified such a requirement, briefly describe the need, the proposed infrastructure capability, the medium-term goals, impacted research communities, and the timeframe over which you advocate its establishment. Your response can include links to relevant existing reports.

Q36.
Part 3: Industry perspectives
This section is seeking input specifically from industry-based respondents. Other respondents can skip this section.
Recommendation 6 of the 2021 Roadmap related to improvements in industry engagement with NRI. To complement work on this topic that has occurred since then, we are seeking additional advice on NRI requirements as perceived by current or potential industry-based users.

Q37.
3.1 Have you (or your organisation) interreacted with or used Australia's NRI?

- (●) Yes
- ( ) No

Q38.
3.2 If so, please briefly outline the NRI capabilities you (or your organisation) have interacted with or used. Do not limit your response to NCRIS capabilities.

The project is a collaborative effort between the Australian National University (ANU) Heavy Ion Accelerator Facility (HIAF) and Zero-Error Systems (ZES), a Singaporean company specialising in space-grade semiconductor solutions. The primary objective is to commercialize ANU's advanced radiation effects testing services by collaborating with ZES to conduct 10 heavy-ion tests on various proprietary semiconductor microchips produced by ZES. Over three years, the project will primarily focus on refining test methodologies for various use cases to enhance HIAF's testing capabilities and commercialisation of HIAF’s service offering. This collaboration will position ANU-HIAF as a leader in the region for providing critical testing services, thereby expanding its market reach, and creating new revenue streams. Another key component of the project includes ANU's participation in the Global Science and Technology Conference in Singapore. This event will serve as a platform to promote HIAF’s testing services to a broader regional industry, fostering new connections and partnerships. By showcasing the advanced capabilities of its testing facilities, ANU aims to attract additional international clients, leading to increased exchanges and collaborations with partner countries. This participation allows ANU to boost international science relationships and to support industry growth through targeted research-industry collaborations. By leveraging HIAF’s state-of-the-art testing infrastructure, the project will enable HIAF to establish a strong commercial presence in the global space and advanced manufacturing supply chain. The testing services provided will not only validate ZES's innovative microchip designs but also attract other international clients seeking reliable radiation effects testing. This partnership will bolster HIAF’s reputation, drive economic growth through high-tech manufacturing, and support the development of Australian space industry.

Q39.

3.3 Please indicate your (one or more) primary reasons for interacting with NRI:

- [ ] For expertise or advice
- [ ] Access to research resources or products
- [x] Access to equipment for research
- [x] Access to equipment for operational reasons
- [ ] Help in translating research
- [ ] Access to data
- [ ] Support for clinical trials
- [x] Other (please specify) Heavy-ion test methodologies for Semiconductors, and develop test plan for different CMOS devices for commercial qualification.

Q40.

3.4 If you answered no, please indicate your (one or more) primary reasons:

This question was not displayed to the respondent.

Q41.

Part 4: Other comments

4.1 Please elaborate on any of your above responses or add any other comments relevant to the development of the 2026 Roadmap. Your response can include reference or links to existing reports that you recommend be considered during the 2026 Roadmap development process.

The Heavy Ion Accelerator Facility (HIAF) at the ANU is a one-of-a-kind facility in the Asia-Pacific region, offering a dedicated space radiation testing beamline that is essential for testing semiconductor components for space applications. As a founding member of the National Space Qualification Network (NSQN), HIAF plays a critical role in supporting industry-led space radiation testing, ensuring that companies developing radiation-tolerant technologies can access specialized testing infrastructure within the region. Zero-Error Systems (ZES) specializes in radiation-tolerant microelectronics, our collaboration with HIAF, facilitated through the Australian Government's Global Space and Technology Development Fund (GSTDF), will refine their test methodologies by conducting heavy-ion tests on ZES proprietary chips, . Our partnership will also be instrumental in advancing our research and development of radiation-tolerant semiconductor devices. Radiation effects on electronics present a major challenge for satellite and deep-space missions. HIAF is the only facility in the Asia-Pacific region with a dedicated beamline for space radiation testing, making it a critical infrastructure for companies developing space-qualified electronics. Without access to such facilities, companies like ZES must rely on testing centres in the US or Europe, increasing costs, logistics complexity, and delays in the testing process. Despite its unique capabilities, HIAF requires strategic upgrades to meet evolving industry standards for space radiation testing, and to become a globally competitive radiation testing service provider. Currently, HIAF cannot produce beams at sufficiently high energies comparable to leading international laboratories, which is necessary for securing compliance with global test standards like JESD57A and JESD234. The lack of high-energy beam capabilities hinders its ability to attract wider global partnerships. Upgrading HIAF-SIBL to produce high-energy heavy ion beams (100 MeV/nucleon or greater) would increase current capabilities 10–20 times, aligning with international standards and meeting industry demand for advanced radiation testing. Without upgrades, Australian and Asia-Pacific companies will continue to face limited local options for radiation effects testing, forcing reliance on the US or European facilities with multi-year wait times and prohibitive costs (thousands of USD per hour). Through NSQN's coordinated framework, HIAF has already demonstrated its ability to serve as an industry-facing radiation testing service, securing NSQN's place in the NRI Roadmap will help reinforce HIAF's position as a regional leader in space radiation effects research, strengthen international partnerships, reduce barrier, and paves way for a regional ecosystem for space semiconductor development and testing, ensuring that companies across the Asia-Pacific region can develop, test, and qualify radiation-tolerant components.

Q49.

4.2 Optional Document Attachment.

Note: Our strong preference is that answers are provided against the relevant questions in the survey.

However, this file upload option is available for submissions in file format, where needed. Please ensure the document includes your name or organisation.